

**OFFICE OF CONTRACT ASSURANCE
LAWRENCE BERKELEY NATIONAL LABORATORY**

Internal Assessment

Of The

LBNL Performance-Based Environmental Management System

September 2006

Executive Summary

The Lawrence Berkeley National Laboratory (LBNL) Performance-Based Environmental Management System (EMS) was developed during 2003 and fully implemented during 2004. In 2005, the EMS program was reviewed by LBNL's Office of Contract Assurance and then by NSF International Registrations, Ltd. to determine (1) whether all programmatic activities were completed and (2) the level of effectiveness of the program. On November 16, 2005, NSF issued a Citation of Conformance that validated LBNL's implementation of an EMS. Based on the strength of the Laboratory's EMS and the results of these assessments, on December 28, 2005, the DOE Berkeley site manager sent a letter to DOE's Office of Science director confirming that the EMS fully conforms to EMS requirements under DOE Order 450.1, *Environmental Protection Program*.

The annual review of environmental aspects and identifying/updating significant impacts began in March 2006, followed by the process of developing/updating environmental management programs (EMPs). The program has been very successful in the implementation of these activities, and almost all were performed to the satisfaction of the EMS Plan and the corresponding procedures. Oversights regarding Core Team participation in the annual aspects/impacts review and training of a staff member led to two findings.

The findings in conflict with the LBNL EMS Plan and associated procedures are:

- Annual Aspect/Impact review did not include representation from the Facilities Planning Department.
- A staff member was listed as an EMP responsible person for ten months prior to receiving documented EMS awareness training.

The EMS Program experienced several successes through the implementation of nine EMPs. For example, a Dolphin water treatment system was installed at the building 37 cooling tower to reduce water consumption and chemical usage. To reduce electrical and natural gas use at buildings 50A and 70, HVAC ducts were sealed using a process developed by LBNL's Environmental Energy Technologies Division. Lastly, based on a return-on-investment analysis prepared under an FY2005 EMP, in FY2006 LBNL purchased two filmless digital imagers for the Life Sciences Division to reduce low-level radioactive waste generation and related disposal costs by up to \$10,000 per year. Other EMPs are on schedule to achieve similar success. For example, the Procurement Department developed and began to implement strategies for increasing purchases of Energy Star Products and Recycled Content Products. Another ongoing EMP is to track implementation alternatives for reducing diesel particulate matter (DPM) emissions, with a 5% reduction per year target.

Introduction

LBNL developed a Performance-Based EMS to satisfy the requirements of DOE Order 450.1, *Environmental Protection Program*. The LBNL EMS model is a systematic

approach to ensure that environmental stewardship activities are well managed and provide sound business value. This order also established that the EMS must be integrated with the existing Integrated Safety Management (ISM) system.

The LBNL Performance-Based EMS Plan requires an annual internal assessment of the LBNL environmental management system. The internal assessment evaluated the implementation of the EMS against the requirements of the LBNL Performance-Based EMS Plan and supporting procedures. This included maintaining an active EMS Core Team, training appropriate staff, performing an environmental aspects review, and creating EMPs.

The assessment included interviews with senior LBNL managers who are members of the EMS Management Review Team, the EMS Core Team Leader, EMS Core Team Members, and the ISM leader.

Description of the Audit

Michelle Flynn of the Office of Contract Assurance performed the assessment. The opening and closing meetings were held, respectively, on September 5 and September 28, 2006 with the Core Team Leader and an observer from the DOE Berkeley Site Office (BSO). The BSO observer attended the interview of the Core Team Leader, and was unable to attend interviews of other personnel.

Individuals interviewed were:

- David McGraw, Associate Laboratory Director
- Jeffrey Fernandez, Chief Financial Officer
- Howard Hatayama, Environment, Health & Safety Division Director
- Ron Pauer, EMS Core Team Leader
- Steve Black, EMS Core Team Member
- Michael Dong, EMS Core Team Member
- Robert Fox, EMS Core Team Member
- Derrol Hammer, EMS Core Team Member
- Richard McClure, EMS Core Team Member
- Nancy Rothermich, EMS Core Team Member
- John Speros, EMS Core Team Member
- Richard DeBusk, Occupation Safety Group Leader and ISM leader

Documents and records reviewed were:

- LBNL Performance-Based EMS Plan
- EHS Procedure 271, Establishing the EMS Implementation Team
- EHS Procedure 272, Identification of Significant Environmental Aspects and Impacts
- EHS Procedure 273, Environmental Management Programs
- EHS Procedure 274, Training
- EHS Procedure 275, EMS Assessments and Audits
- EHS Procedure 276, Management Review
- EMS Training program
- EMS Training records
- Core Team meeting minutes
- Aspects worksheets
- EMPs and related documents
- Management review meeting minutes
- EMS Gap and Strategic Analysis for LBNL, September 2002

Assessment Findings

The detailed assessment results are presented in the framework of the LBNL Performance-Based EMS Plan. Therefore, results are presented under the headings:

- EMS program
- EMS implementation team
- Identification of significant aspects and impacts
- Environmental management programs
- Training
- EMS assessments and audits
- Management review

Assessment results are categorized either as findings, observations, or noteworthy practices. Findings are deficiencies in conflict with the LBNL EMS Plan and associated procedures (EH&S Procedures 271-276). Observations are conditions that may lead to conflict with these program documents and also recommendations that may benefit the EMS program. Noteworthy practices are exemplary work activities or policies.

EMS Program

LBNL continues to integrate EMS with the existing ISM system. The institutional ISM Plan was reissued in February 2006 including extensive EMS details and expanding the seven guiding principles of ISM to incorporate EMS features. In addition, the Site Environmental Report (SER) for 2005 (published July 2006) included a chapter on LBNL's EMS. A description and status of LBNL's EMS will be included in future SERs.

The EMS website contains current information and includes the EMS Plan, the nine EMPs developed during the 2005-2006 EMS cycle, two EMS fact sheets and the 2005 internal and third-party audit reports. This website is accessible to all LBNL staff and the general public. The public can provide EMS feedback through the web-based EHS Suggestion Box.

No findings identified.

EMS Implementation Team

The EMS Core Team, led by the Environmental Services Group Leader, designed, implemented, and maintains the EMS Plan. The team meets on a regular basis, approximately quarterly. Meetings are used to train Core Team members, identify significant aspects and impacts, and discuss implementation of the EMPs. The addition of the Facilities Plant Operations Department Head and Procurement Department Head as Core Team members are noteworthy, and addressed in the Management Review section of this report.

No findings identified.

Identification of Significant Aspects and Impacts

The EMS team began the latest annual review of environmental aspects and determination of significant impacts in March 2006. These aspects involve waste generation and recycling, emissions and discharge, materials and resources use, and land and building development and use. The review process is documented in worksheets and aspects are characterized by the requisite factors, including amounts/size, health risk, limits, and goals. Aspects are then scored according to a prescribed list of categories.

Finding: Per the meeting minutes, the primary purpose of the March 23, 2006 Core Team Meeting was to review the Aspects/Impacts Worksheet, update the impacts, and determine which aspects have significant impacts. EH&S Procedure 272, Identification of Significant Environmental Aspects and Impacts, states that the core team reviewing aspects and impacts will include key representatives of the organization. There was no representation from Facilities Planning at either the March meeting or the continuation meeting held on April 28, 2006.

Observation: At the March 2006 Core Team Meeting members agreed to revise the Aspects/Impacts Worksheet, eliminating one significance category and changing the title of another. This change is not yet reflected in EH&S Procedure 272, Identification of Environmental Aspects and Impacts.

Environmental Management Programs

EMPs are used as a formal planning tool and include information regarding tasks, responsibilities, timing, affected department, monitoring requirements, and metrics. The EMPs list objectives and targets established for each significant aspect.

Observation: In both EMPs 04-04A and 06-08A, (reduce and control vehicle fleet petroleum consumption, respectively), target completion dates for reporting were missed. In neither case was there an impact to the EMP; however, that fact is undocumented. Decisions as to whether or not a deficiency constitutes a nonconformance are relevant to the EMPs, and their inclusion in either the EMPs or Core Team meeting minutes would add clarity during future program assessments and audits.

Observation: Resource limitations impacted monitoring activities under one EMP, and threaten to impede future EMP development, implementation, and monitoring:

- As reported to the EMS Core Team Leader by the Facilities Design and Construction representative in September 2006, monitoring of water usage under EMP 05-04B (Dolphin water treatment system in building 37 cooling tower) was discontinued due to resource limitations. Furthermore, limitations in monitoring future candidate activities and/or established EMPs will reduce LBNL's ability to understand the associated environmental benefits.
- There is reduced effort on hazardous and radioactive waste generating process evaluations following the elimination of a position in the Waste Management Group in early FY2006.
- There are five improvement actions due between September 30 and December 30, 2006 under EMP 04-07C (reduce commute traffic). As annotated in the latest EMP update, two of these actions require discussion with the new group manager of Facilities Planning to determine the level of support available.
- Data collection to support activities under EMP 04-05C [increase procurement of Energy Star Products (ESPs) and Recycled Content Products (RCPs)] is an arduous task. Further expansion in the use of PeopleSoft for procurement activities will alleviate some of the burden, but will still require vigilance in training staff in its proper use in order to obtain relevant data.

Observation: Promotion of the EMPs to the general LBNL population may assist in achieving targets, particularly for EMP 04-05C (increase procurement of ESPs and RCPs). Periodic presentations of procurement data to all Laboratory Senior Management would heighten Divisions Directors' awareness of purchasing activities within their division. In addition to the division self-assessment expectation for work planning considerations of environmental impacts, inclusion of a RCPs purchasing expectation would provide further incentive to purchase RCPs.

Noteworthy Practice: The Procurement Department sought input from StopWaste.Org, a public agency of the Alameda County Waste Management Authority and the Alameda County Source Reduction and Recycling Board, in developing supplier/vendor contract language for environmentally preferable purchasing. The Procurement Department Head fully supports his staff's involvement with this agency.

Noteworthy Practice: A return-on-investment opportunity identified in EMP-04-02A (low-level radioactive waste reduction) and proposed in March 2005 was funded in FY2006. This EMP involved the purchase of two filmless imagers for the Life Sciences Division to reduce low-level radioactive waste generation and related disposal costs.

EMS Assessments and Audits

Internal and external audits were conducted as required. In June 2005 the Office of Contract Assurance conducted an internal audit, followed by a third-party audit in September 2005. Both audits included interviews of key EMS personnel and review of all relevant documentation.

Noteworthy Practice: Findings from the internal audit were entered and tracked in the LBNL Corrective Action Tracking System, and addressed expeditiously in preparation for the third-party audit.

Training

All Core Team members have attended comprehensive EMS training addressing EMS awareness, environmental aspects and impacts, determination of significance, and preparation of EMPs. The Core Team Leader has attended an EMS implementation training course presented by an external party, and most of the Management Review Team has received EMS awareness training. The internal auditor has attended EMS implementation and EMS auditor training.

Finding: EH&S Procedure 274, Training, requires EMS training for key EMP implementation staff. A non-Core Team staff member has been listed as a co-responsible person for one EMP since October 2004, yet he did not receive documented EMS training until August 2005.

Observation: The EH&S Division Director has not yet received documented EMS awareness training, though he has led the division for over eight months. He will receive the training prior to the next Management Review in October or November 2006. Providing EMS awareness training on an ad hoc basis when there are changes in the EMS Management Review Team membership would enhance communication regarding the EMS among key personnel.

Noteworthy Practice: All Core Team members and backups have received comprehensive EMS training. This continued to pose a challenge due to turnover in Core Team membership and the addition of Core Team backups.

Management Review

The Management Review includes the appropriate participants, including staff with broad organizational responsibility and decision making authority. The last annual Management Review was conducted in June 2005 and the next will be scheduled for October or November 2006.

Observation: Members of the Management Review would benefit from more frequent briefings on the EMS, providing a forum for timely discussion of resource concerns and the status of EMPs.

Noteworthy practice: Senior Laboratory Management demonstrates commitment to the success of the EMS. Upon hiring the new Procurement Department Head, the Chief Financial Officer assigned him to the EMS Core Team. The Procurement Department Head actively participates in the EMS processes. At the June 2005 Management Review the Core Team Leader expressed concern about core team membership. As a result of the discussion that ensued, the Facilities Division Director assigned the Plant Operations Department Head to the Core Team. This individual serves as the backup for two other Facilities Core Team members and provided input in developing EMPs.